Introduction
This study focused on global issues of ecological sustainability in a variety of local early childhood education contexts, drawing from both kaupapa Māori and Western perspectives. Ecological sustainability as a teaching and learning issue (Gruenewald, 2003) was, within this project, philosophically grounded in an ethic of care (Martin, 2007; Noddings, 2005) and an ethics of place (Smith, 2001), with a particular focus on respect for Papatuanuku, the Earth Mother (Marsden, 2003). The teachers, tamariki and whānau of 10 early childhood centres from across Aotearoa New Zealand participated in the project.
Aims and objectives
Our overall intention for this project, which was inspired by a conversation with teachers, was to build a culture of ecological sustainability practices in early childhood education. As part of this project we wanted to expand the focus of an ethic of care that has already been strongly articulated by some teachers in the context of kaupapa Māori perspectives pedagogies (Ritchie & Rau, 2006) to embrace kaia kātanga, a notion of guardianship, responsibility and care for the environment (Benton, Frame, & Meredith, 2007). Recent research in early childhood education in Aotearoa New Zealand has documented ways in which teachers have moved from “teaching about” tikanga Māori, to enacting and modelling Māori values, such as manaakitanga, within everyday routines and pedagogies (Ritchie & Rau, 2006). Similarly, this project focused on enacting ecological sustainability through a holistically integrated pedagogical and philosophical focus incorporating kaupapa Māori understandings. An innovative aspect of the research was to investigate how responses to global issues, such as climate change, could be integrated into local practice (Smith, 2001, Duhn, 2006).

Research questions
There were four broad areas of focus.
1. What philosophies and policies guide teachers and whānau in their efforts to integrate ecological sustainability into their current practices?
2. How are Māori ecological principles informing and enhancing a kaupapa of ecological sustainability, as articulated by teachers, tamariki and whānau?
3. In what ways do teachers and whānau articulate and/or work with pedagogies that emphasise the interrelationships involved in an ethic of care for self, others and the environment in local contexts?
4. How do or can centres work with their local community in the process of producing ecologically sustainable practices?

Research design and methodology
The study used a qualitative approach, incorporating aspects of narrative (Clandinin, 2007), kaupapa Māori (Bishop, 2005; Smith, 1999, 2005), critical indigenous (Denzin, Lincoln, & Smith, 2008) and ethnographic methodologies (Aubrey, David, Godfrey, & Thompson, 2000). An initial collective hui enabled teachers to be involved in discussions around research design, ethics and data-collection methods. Kuia and kaumātua provided their tautoko and wisdom. Ongoing reflexive, supportive relationships between the teacher co-researchers of each participating centre and the academic researcher(s) were also central to the research process. Our intention was to build a research community of practice, the foundations of which are trusting and respectful relationships that allow for challenge and critique (Wright & Rider, 2006). We gathered data in a range of ways: through interviews, taped discussions, photographs, written narratives, observations, journals and videoing. We transcribed the interviews and analysed them, along with other written data, utilising a qualitative software analysis programme.

Summary of findings
The 10 centres joined the study with a range of background interests and varying levels of pedagogical experience across the dual spectrums of kaupapa Māori and ecological sustainability. All chose their own pathways into broadening their commitment to the research kaupapa, enhancing and deepening pedagogies in specific relation to their own contexts and communities. A range of principles became visible across the project. Some of these were: the value of grounding place-based pedagogies in the home/community nexus of the centre; that indigenous pedagogies are central to conceptualisations of these place-based pedagogies for ecological sustainability in the context of Aotearoa New Zealand; that engagement in this project stimulated new thinking and modes of pedagogical practice; and that this process generated responsiveness and reciprocity among children, whānau and the wider community of each early childhood centre.

One principle is that “place-based pedagogies” radiate out from the centre. A sense of place starts with paying attention to the “here” and “now”, and has a “ripple effect”, as one of the teachers pointed out. In the context of caring for self, other and the environment, “self” stands for more than the “I”: caring for self generally meant caring for those who are part of the immediate, day-to-day kindergarten or centre community, fostering “reciprocal and responsive relationships for children with people, places, and things” (Ministry of Education, 1996, p. 9). Although all kindergartens and centres were committed to implementing the tiriti-based practices required by Te Whāriki (Ministry of Education, 1996), for some of the kindergartens and centres, indigenous knowledges and ways of being were an essential aspect of their engagement with the global issues of ecological sustainability from the outset of their involvement in this study. Initially, it was not “the global” that seemed particularly challenging to some of the teachers. Caring for self generally meant caring for the immediate environment, and, for the teachers, the journey had to start “at home”. Thinking about what constituted their own pedagogy of place included an awareness of indigenous knowledges, because these are specific and unique to Aotearoa New Zealand. Focusing on “place” created an awareness of the significance of local Māori knowledges, as well as, for some, a sensitivity towards and respect for the “otherness” of kaupapa Māori.

The teachers within each early childhood centre community embarked on journeys that contributed to their reconceptualising the “activities” that happen in these different settings in support of ecological sustainability in the everyday lives of children and their families/whānau. There were a range of different desires that created the drive and commitment to enact...
different philosophical and theoretical knowledge(s) in support of ecological sustainability. These included, for example, seeking to be actively involved in practices that consider and act to alleviate climate change; seeking to enact indigenous knowledge(s); and seeking to perform everyday practices that enable children, their family/whānau and teachers to (re)connect and work with the natural world and with processes of sustainable (hand-made) production (for example, through vegetable or other gardening or paper recycling). At the heart of these practices, the teachers and teaching teams were constantly challenged to consider the key “question of provocation”; that is, what makes these practices ethical, and in what ways does “being or becoming ethical” contribute to the principles and practices for (local/global) ecological sustainability.

Children and their families demonstrated their reciprocal engagement with the research kaupapa through the widespread participation in collective endeavours. For example, crop surpluses were freely shared with others through “community basket” or “free shelf” schemes and the “Oooboy” (Out of Our Own Back yards) inspired fruit and vegetable bowl. Participation within the wider community included beach clean-ups, tree planting, fund-raising for the Society for the Prevention of Cruelty to Animals and other local and international community causes, visits to elders in a local resthome and aerobics classes offered for whānau participation at the centre. One centre described these practices as building “community empathy”.

Kairangahau (researchers) from across the services configured possibilities for enhanced global environmental sustainability through integrating Māori ecological knowledge, beliefs, values and systems within centres. The constructs of kaitiakitanga (guardianship) and manaakitanga (care) were central overarching constructs employed by centres. The final report for this study gives narratives gathered from co-researchers, tamariki and whānau that reflect this (available at www.tri.org.nz).

Discussion

Limitations of the project
Since this project investigated practices and knowledges with an analytical lens on the specificity of place and community, this work was not intended to be generalisable in terms of creating models that might be formulaically applied within early childhood education across Aotearoa New Zealand, or internationally. We have, however, identified some philosophical approaches underpinning these particular pedagogical contexts, and, in the final report, provided detailed evidence of how these kinds of approaches can underpin teachers’ work in the context of the wider community.

Contribution to capacity and capability
Teachers in this study were positioned as kairangahau (co-researchers), involved from the outset in designing their own application of research methodology within their specific contexts. We facilitated a supportive, collaborative, collective culture, in which teachers with previous research involvement shared ideas about both the research kaupapa and methodological strategies. The number of recent presentations made by the teachers and researchers, and a scholarship awarded to one of the teachers to further develop this work, reveal the participants’ leadership and sense of responsibility to share knowledge and support others.

Conclusion
The project highlights that teachers, tamariki and whānau are making effective use of complex knowledges and skills to address global issues in their local contexts. The teachers in this project have begun to develop “pedagogies of place” that differ for each centre and its specific communities. Kaupapa Māori constructs such as manaakitanga, wairuatanga and kaitiakitanga were integral to this process.

Implications
This project has demonstrated the significance of early childhood educators generating localised “pedagogies of place” for ecological sustainability, integrating kaupapa Māori notions of kaitiakitanga and manaakitanga along with an ethic of care within their specific communities. The double emphasis on local specificity and global issues that is embedded in concepts such as a critical “pedagogy of place” offer potentially robust and hopeful perspectives for early childhood education. The focus on ethics and the ongoing commitment to critical engagement with power relations has the potential to enable and support local responses to global issues. Enabling teachers to develop complex knowledges and practices requires policy makers, teacher-education programmes and professional development provision to explicitly and urgently integrate a much stronger focus on critical thinking into early childhood education discourse.

Directions for future research
Research that explicitly addresses issues of power in relation to global and local practices and ethics would be able to address important research questions that have emerged in this project, such as: How does an ethic of care for self and other (including nonhuman others) interrelate with global citizenship and democratic practice as an aspect of a pedagogy of place? How do children create meaning of an ethic of care for self and other, including the planet? How is a pedagogy of place maintained and strengthened over time? What are the limitations of such a pedagogy, for example in communities where people struggle to have a sense of belonging? How would a pedagogy of place address issues that arise when people lack access to resources? How can such a pedagogy and an ethic of care support those that may feel excluded (for example, new migrants, those who live in poverty or those who experience violence in their communities)?
References

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Iris Duhn lectures in the School of Critical Studies in Education, Faculty of Education, in The University of Auckland. Her teaching and research focuses on critical childhood studies, in particular globalisation, ecological sustainability and governmentality studies. Her publications and research projects contribute a critical childhood studies’ perspective to early childhood education in Aotearoa New Zealand, and internationally.

Cheryl Rau is of Tainui, Kahungungu and Rangitane descent. Her educational and research focus has centred on Te Tiriti o Waitangi partnerships in Aotearoa New Zealand, with Māori educators articulating strategies which nurture tamariki Māori potentiality across the early childhood community. Cheryl’s 30-year background in education has been across the primary, secondary and tertiary sectors. During the past 13 years she has been an early childhood educator and coordinator/director of Ngāhiri professional learning programmes. Last year she joined Te Tari Puna Ora o Aotearoa as the Central Regional Manager.

Janita Craw teaches across a range of programmes within AUT’s School of Education. Her research interests have included a range of curricular areas relevant to early childhood education, research in education and beyond—in the world of visual art. She is interested in critical (post/structural, post/feminist/other) theories and interdisciplinary arts-based research practices that explore “thinking through and with visual art/artists” works as alternative but valuable research methodology.